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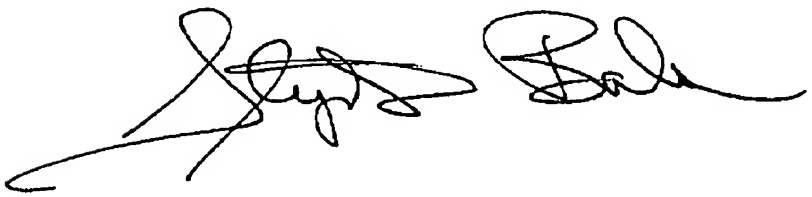
This Fax contains the updated Reply Brief (8 pages) for Patent Application: 10/681,497 in response to the Examiner's Answer of April 18, 2007.

Examiner Matthew J Daniels

Inventor: Stephen G. Bales



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TRANSMITTAL FORM

(to be used for all correspondence after initial filing)

Total Number of Pages in This Submission: 17

Application Number	10/681,497
Filing Date	October 6, 2003
First Named Inventor	Stephen G. Bales
Art Unit	1732
Examiner Name	Matthew J. Daniels
Attorney Docket Number	LA 001

ENCLOSURES *(Check all that apply)*

- ☐ Fee Transmittal Form
  - ☐ Fee Attached
- ☐ Amendment/Reply
  - ☐ After Final
  - ☐ Affidavits/declaration(s)
- ☐ Extension of Time Request
- ☐ Express Abandonment Request
- ☐ Information Disclosure Statement
- ☐ Certified Copy of Priority Document(s)
- ☐ Reply to Missing Parts/ Incomplete Application
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- ☐ Proprietary Information
- ☐ Status Letter
- ☐ Other Enclosure(s) (please identify below):

Remarks

Enclosed is an 8 page Reply Brief in response to the Examiner's Answer mailed April 18, 2007.

SIGNATURE OF APPLICANT, ATTORNEY, OR AGENT

Firm Name			
Signature			
Printed name	Stephen G. Bales		
Date	May 30, 2007	Reg. No.	

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Signature			
Typed or printed name	Stephen G. Bales	Date	May 30, 2007

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Appl. No.	:	10/681,497
Applicant	:	Stephen G. Bales
Filing Date	:	October 8, 2003
Title	:	Lignocellulosic, Borate Filled, Thermoplastic Composites
Examiner:		Matthew J. Daniels
Art Unit	:	1732
Docket No.	:	LA 001
Customer No.		000048373

REPLY BRIEF

May 30, 2007

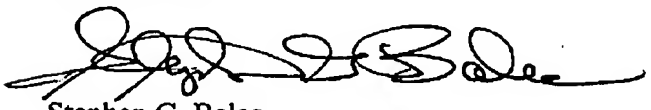
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

Pursuant to 37 C.F.R. § 41.41, please enter and consider the following Reply Brief to the Examiner's Answer mailed April 18, 2007 in the above-identified application.

Reference will be made to various passages in the Examiner's Answer. Although the Appellant and Examiner have disagreed on technical issues, at all times the Examiner conducted himself in a professional and courteous manner.

Respectfully,



Stephen G. Bales

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I. THE 35 U.S.C. § 102 REJECTION OVER AIDA (USPN 5221781) SHOULD BE REVERSED [Reference Claims 1, 4, 5, 11, and 15].

A. The present invention requires a lignocellulosic material (ie. an organic filler); Aida does not.

The Examiner admits Aida discloses multiple embodiments, but at page 7 of his Answer argues:

> Thus, it is submitted that the filler is a required component, and that the substantial number of lignocellulosic fillers recited is sufficient to anticipate the claimed invention in combination with one skilled in the art could anticipate the claimed invention.

Aida does not teach that either an inorganic filler (5:64-6:10) or an organic filler (6:18-21) is a required component. Aida uses the term "filler" (item H) in claim 1 (15:59) and at 3:35 to include flame retardants (6:30 – 7:20) as well as inorganic fillers and organic fillers; otherwise his described composition would not include a flame retardant as items A to G (3:24-35) are not flame retardants. Aida states the composites' "filler" (item H) could be as low as 5 parts by weight (3:35 and 15:59-claim 1). He further states that if a flame retardant is added the minimum amount must be at least 5 parts by weight (7:16-27), and if either an organic or inorganic filler is used it must be also be at least 5 parts by weight (6:22-29). Therefore at Aida's lower limit for item H of 5 parts, the composition will contain a flame retardant or filler (organic or inorganic) but not both.

As further confirmation that Aida does not require the addition of an organic or inorganic filler, his claim 6 (16: 45-47) states the "filler" (item H listed in claim 1) could be limited to either an inorganic filler or a flame retardant. This is also verified by Examples 1-14 none of which contain a fire retardant (9:32 -10:20) and Examples 15-24

none of which contain organic or inorganic fillers (10:21-11:1). And as final confirmation, Aida states "the filler (H) used in the present invention there are mentioned inorganic and organic fillers as well as flame retardants" (5:61-63). In summary, the instant invention requires the inclusion of a lignocellulosic material as a limitation and Aida does not.

B. The Examiner's anticipation argument requires "picking and choosing".

Aida does not provide any teaching or motivation on how, why, or even whether, to combine inorganic fillers, organic fillers, inorganic fire retardants, and organic fire retardants. His teaching describes how to produce a composition balanced in rigidity, impact resistance, heat resistance, and dimensional stability no matter which of the 1,639,440 identified combinations[1] of additives is utilized. There is no disclosure that would lead one of ordinary skill in the art to the instant invention's required combination of a thermoplastic resin, lignocellulosic material, and zinc borate. The only way one could arrive at a finding of anticipation would be the selective "picking and choosing" of the desired combination from the thousands presented by Aida.

II. THE 35 U.S.C. § 102 OR IN THE ALTERNATIVE THE 35 U.S.C. § 103 REJECTION OVER AIDA (USPN 5221781) SHOULD BE REVERSED. [Reference Claims 2 and 3]

As described in I above, Aida does not teach that an inorganic or organic filler is a necessary component. However for claims 2 and 3 there are further arguments for reversing this rejection.

[1] 36 inorganic fillers x 11 organic fillers x 23 inorganic fire retardants x 18 organic fire retardants x 10 plastic combinations (1 thermoplastic and 9 types of rubbery substances) = 1, 639,440

A. Aida does not disclose inorganic flame retardants below 40 parts (13.3%); this is well above the 12 percent maximum of the present invention and precludes a finding of either anticipation or obviousness.

Appellant disputes the Examiner's position that Aida makes a broad disclosure of 5 to 200 parts of inorganic flame retardants. Aida at 7:13 reads "The amount of these flame retardants is in the range of 5 to 200..." and describes the overall range of all fire retardants. He then specifically states that when using only organic flame retardants the amount is in the range of 5 to 20 parts by weight (7:16-18) and with inorganic flame retardants it is 40 to 200 (7:20). The overall range of 5 to 200 parts is derived from combining the lower limit of the organic flame retardants and the upper limit of the inorganic flame retardants. As a result Aida does not provide the motivation to load an inorganic flame retardant, such as zinc borate, at a level below 40 parts (13.3 percent). This is above the instant invention's highest loading level of 12 percent (claim 2).

B. Even assuming arguendo that Aida does allow inorganics at less than 40 parts, he would require an organic flame retardant – a limitation not found in the instant invention—and there still is no motivation or direction that would support obviousness.

At page 9 the Examiner admits that when inorganic flame retardants are used at low concentrations, presumably below 40 parts by weight, Aida suggests they must be combined with organic flame retardants. This is not a limitation of the current invention.

The Examiner then argues that Aida is sufficiently specific to anticipate the claimed range [Claim 2: 2-12%; Claim 3: 3-5%] even though the reference could have a flame retardant range of 0-66.6% (see Appeal Brief, p 10), a corresponding lignocellulosic filler range of 66.6 to 0%, and require the addition of organic flame retardants. But from this

wide range of possibilities, there is no explanation of how Aida motivates one of ordinary skill to combine at least 5% of an organic flame retardant with between 2-12% (or 3-5%) of a boron-containing inorganic flame retardant, and then add a lignocellulosic based organic filler. The prior art gives no direction as to how, or in what ratio, these additives should be combined or why a lignocellulosic material should even be added. The latter would in fact lead away from lowering the fire resistance of the composite since lignocellulosic material is flammable.

III. THE 35 U.S.C. § 103 REJECTION OF CLAIMS 6 AND 8-12 OVER AIDA (USPN 5221781) IN VIEW OF LLOYD (USPN 6368529) SHOULD BE REVERSED.

A. Lloyd's teachings do not sustain Examiner's argument that in general calcium borate's superior flow properties provide motivation.

The Examiner argues at page 10 Lloyd's general statement (9:1-5) that calcium borates have better flow properties provides a motivation to make the Aida-Lloyd combination. The Examiner states at page 10:

> The Examiner responds that Lloyd provides one example which would support Appellants position, but the broad suggestion is that "An additional advantage of producing composite wood products with calcium borate additives in place of conventionally used zinc borate is that calcium borates have much better flow properties making them easier to store and handle in processing equipment (9:1-5).

Lloyd's examples (Table 3) and description (10:15-20) contradict the Examiner's contention of a broad suggestion. Both the numerical results of Table 3 and Lloyd's assertion that "Nobelite is preferred for superior flow properties" indicate that in flow property tests of colemanite F, colemanite glass grade, and nobleite only the latter was superior to zinc borate. Lloyd identifies six total calcium borates (ulexite, nobleite,

hydroboracite, gowerite, colemanite F, and colemanite glass grade), tests three, and states only one is superior to zinc borate in flow properties. Table 3 indicates that most of the parameters for colemanite are inferior to zinc borate. This does not support a general concept that calcium borates have superior flow properties but rather teaches away from this concept for colemanite and does not provide motivation that ulexite, hydroboracite, and gowerite have superior flow properties.

B. Lloyd does not teach calcium borate's toxicity properties are lower than other borates (which would include zinc borate).

The Examiner states at page 10:

The Examiner responds that a less toxic product would generally motivate one to make the combination. The reference suggests that the lower toxicity is beneficial in use and disposal (2:38), and does not pertain only to the disposal phase, as suggested by the Appellant's arguments.

Lloyd does not state that calcium borates are less toxic than zinc borate; he only states "calcium borates are considered to have a low impact on the environment, with low mammalian toxicity, ..." (2:2:36-37). Lloyd makes the same statement for all borates, which would include zinc borate, at 1:28-29. The only advantage cited over zinc borate is in the disposal in mulch which is not applicable in thermoplastics as described in the Appeal Brief, p12.

C. Lloyd does not teach that calcium borate produces lower tool wear than zinc borate.

The Examiner states at page 10:

The Examiner asserts that the motivation found in the reference has been taken at face value for its explicit suggestion. Even if Appellant's assertions regarding the hardness of zinc borate and calcium borate are correct, the motivation is based on tool wear and not inherent hardness.

Lloyd makes a statement that zinc borate using the term may cause tool wear, but provides no supporting data or studies (1:53-55). The only possible cause-effect relationship given by Lloyd is hardness. Thus one of ordinary skill would not be motivated to use colemanite, the only calcium borate with more effective fungal properties, since it has a higher hardness rating than zinc borate.

D. Lloyd's teaching adds calcium borate to a different composite for a different purpose under different environmental conditions at different ranges. The instant invention's benefits are not inherent in Lloyd's teaching.

The Examiner states at page 11:

> The Examiner responds that neither Aida's method nor the instant method are limited to any intended use. There is no suggestion that one of ordinary skill would lack a reasonable expectation of success in the claimed method of making and Lloyd clearly achieved sufficient success to claim substantially the same weight percentage calcium borate.

The claims of the instant invention are interpreted through the specification, which [0003] states "This visual degradation, caused by mold, is a significant problem since major commercial uses of lignocelluosic thermoplastic composites, including decking and fencing, rely on their aesthetic appeal to compete in the marketplace." The direct exposure of these products is in contrast to Lloyd's teaching that calcium borate is for use in low moisture environments (see Appeal Brief at page 13). Appellant's specification at [0010] also states "The invention utilizes the robust nature of the thermoplastic binders to accommodate these increased loadings without creating strength or dimensional problems and...." Only by incorporating calcium borate at higher ranges[2] into a composite with a thermoplastic binder at 25 to 75 percent by weight (vs. Lloyd's thermoset at 1.5 to 25 percent; see 3: 7-20) could this be achieved.

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[2] Instant invention: 2 to 12 percent; preferred of 3 to 5 percent
Lloyd: 0.1 to 4 percent; preferred of 0.5 to 2 percent

The Examiner produces no evidence or argument that would explain how one of ordinary skill in the art would be led by either Lloyd, or Aida in view of Lloyd, to recognize that adding calcium borate from 2 to 12 percent, loadings that can require the robustness of thermoplastic binder at levels of 25 percent or greater, would achieve mold resistance in an environment directly exposed to moisture. It is noted that Lloyd never discusses or examines mold resistance and states that calcium borate is for use in low moisture environments.

Finally, the argument of inherency (Examiner's Answer at page 412) is not valid in this case as inherency may not be established by probabilities or possibilities. The mere fact that a certain thing *may* result from a given set of circumstances is not sufficient. *See In re Oelrich*, 666 F. 2d 578, 581, 212 USPQ 323, 326 (CCPA 1981), *quoting Hansgirg v. Kemmer*, 102 F. 2d 212, 214, 40 USPQ 665, 667 (CCPA 1939). Although Lloyd's result-effective variable is calcium borate loading, his result is decay resistance – not mold resistance. Therefore one of ordinary skill in the art optimizing on this variable would arrive at a solution that may, or may not, produce mold resistance. As taught by Lloyd, and confirmed by his examples, adding calcium borate at levels as low as 0.5 percent can achieve decay resistance – however the present invention identifies that levels of 2 percent or greater are required to produce mold resistance.

Summary

For at least the above reasons, claims 1-6, 8-12 and 14-15 are believed to be patentable over the cited references. Accordingly it is respectfully requested that the rejections of these pending claims be reversed.